

FOREST FILES

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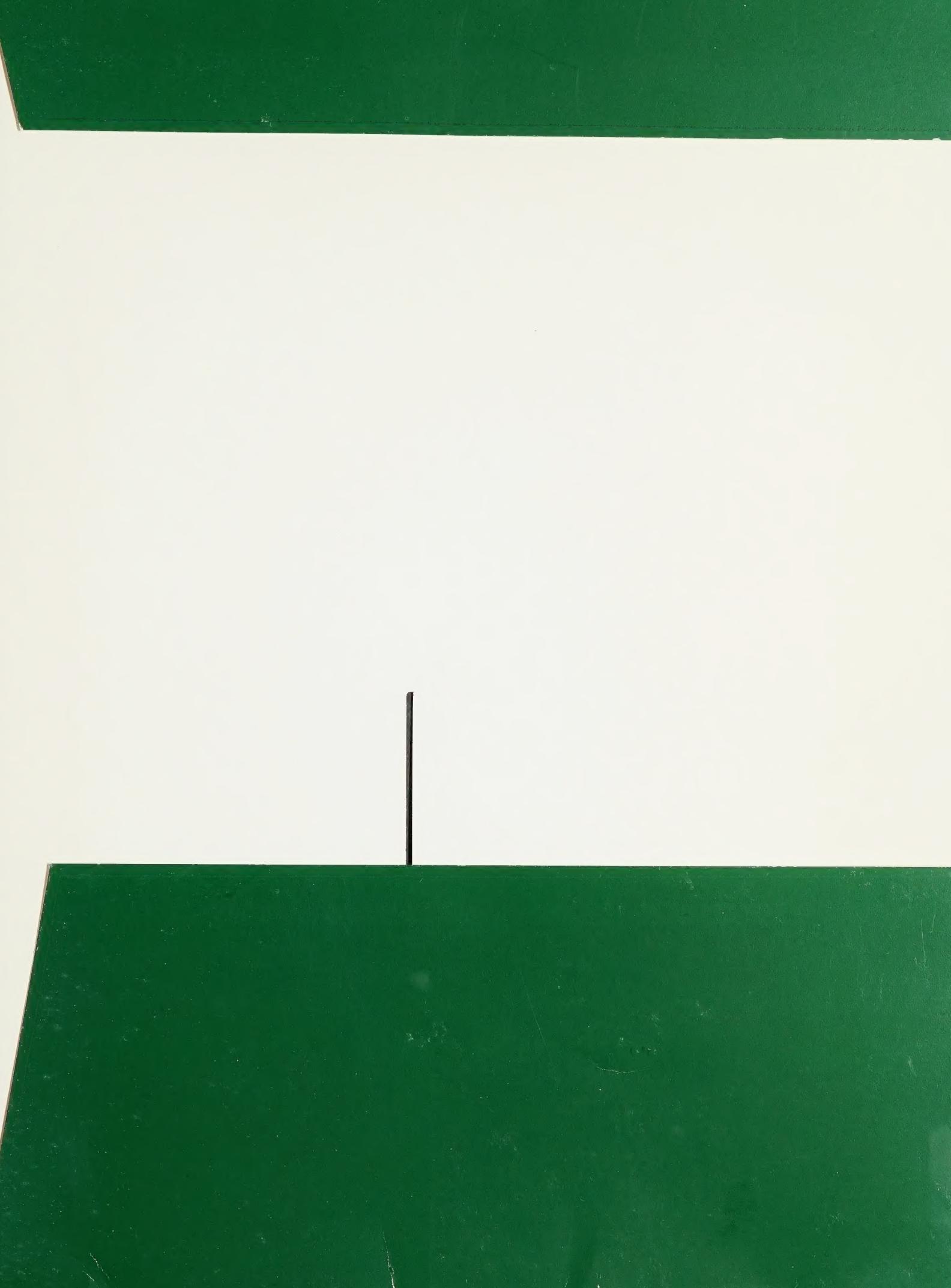
Ontario's forest resources:
some facts about forests

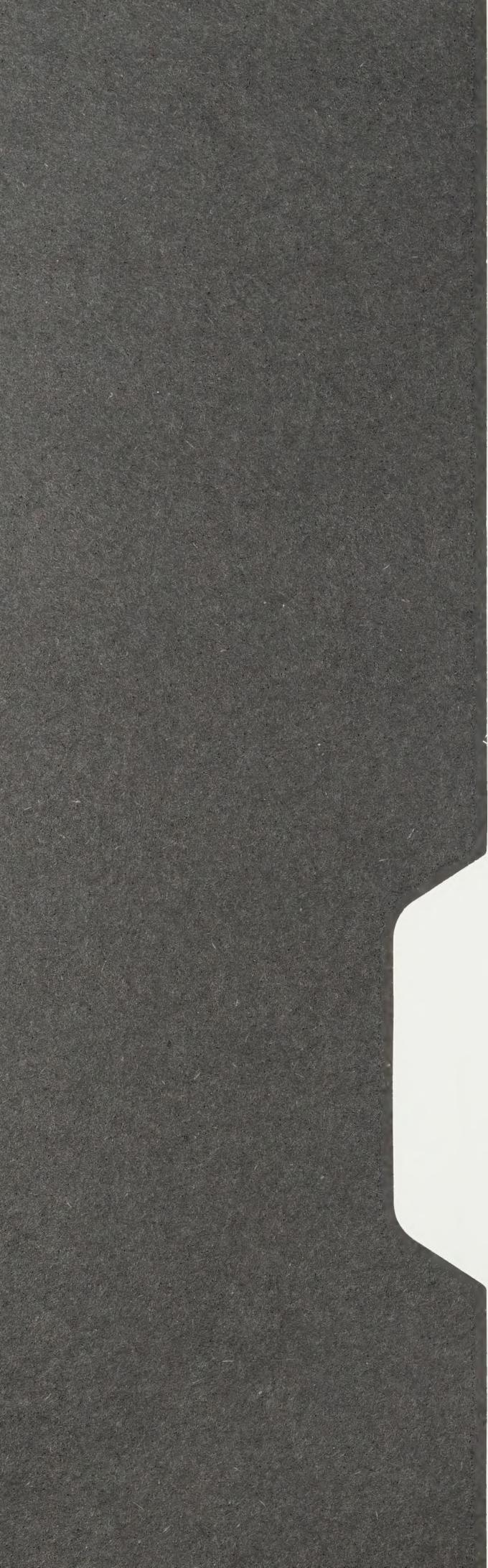


Ministry of
Natural
Resources



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Cover Photo: A young white pine seeks a place in the sun in an aging poplar forest.

Glossary of Terms

Clear-cut: The removal of the entire merchantable (commercial) crop of the desired species of tree in one section of forest in one operation. The clear cut may be of different sizes or shapes and is often done as block or strip cutting.

Forest Management Agreement (FMA): A 20-year contractual agreement under the Crown Timber Act, between the Ontario Ministry of Natural Resources and a company, reviewed at five-year intervals, and extended for a further five years if the obligations have been met.

The company agrees to undertake all forest management planning, subject to approval by the Minister, and to implement the plans for each five-year term, including site preparation, regeneration, tending, access roads and harvesting. The agreement provides for a continuous supply of forest products for the company's wood-processing plants and ensures that the forests are harvested and regenerated to produce successive crops of timber on a sustained-yield basis.

Forest Resources Inventory (FRI): Using a combination of aerial photography, photo-interpretation and ground verification, the inventory provides a picture of the extent, nature and condition of Ontario's forests. The FRI is carried out by the Ministry of Natural Resources, or by the ministry and the forest industry on a cost-shared basis.

Free-to-Grow: Refers to a stand of trees that have grown to a height where they are essentially free from competing vegetation.

Harvesting: The removal of timber for use. Includes felling, extraction and sometimes initial processing.

Maximum Allowable Depletion (MAD): The calculated amount of area from which timber may be depleted over the five-year term of a Timber Management Plan by any means, including harvesting, fire, insects, disease, or allocation of part of the area for purposes other than logging, such as wildlife habitat.

Not Satisfactorily Regenerated (NSR): Productive forest land not stocked to a specified standard or which has not attained free-to-grow status. Such land may require tending, site preparation, planting or seeding to improve or establish tree growth.

Prescribed Burn: Planned and controlled fire used as a form of site preparation for purposes of forest regeneration by eliminating competing vegetation. It may also be used as a means of reducing the risk of wildfire by consuming brush, which ignites easily and burns rapidly, under controlled conditions.

Productive Forest: All forest areas capable of growing commercial timber.

Protection Forest: Forested areas managed primarily to protect soil, water, landscape and other values.

Regeneration: The renewal of a tree crop by natural or artificial (sowing and planting) means. This term may also be used to describe the young crop itself.

Remote Sensing: Technology which produces photographs of the earth's surface taken from the air. The infrared "pictures" are examined by experienced photo-interpreters who can tell, for example, conditions of the forest in a particular area and the progress of regeneration. The sensing may be done by equipment on airplanes or orbiting satellites.

Rotation: The planned number of years between the year of harvest of one crop of trees and the harvest of the next regenerated crop.

Scarification: Mechanical loosening of the topsoil of open areas, or breaking up the forest floor, in preparation for regeneration by natural seeding.

Seed Orchard: Plantations of genetically superior or desirable trees grown to produce seeds. The orchards are essentially breeding stock for new forests. The offspring of the orchard trees are planted under normal field conditions.

Selection Cut: The removal of mature trees, either as scattered individuals or as small groups, at relatively short intervals for an indefinite period. The objective is a forest stand with trees of all age classes distributed throughout.

Shelterwood Cut: The removal of mature trees in a series of two or more cuts (in either entire stands or alternating strips). Trees left standing provide seed and cover conditions for natural or artificial regeneration.

Silviculture: The science and art of cultivating forest crops; the theory and practice of controlling the composition, constitution and growth of forests.

Site Preparation: Disturbance of the forest floor and the topsoil to create suitable conditions for natural or artificial regeneration.

Slash: Debris of tree limbs and tops and unmerchantable timber often left by harvesting operations; can also be left after windstorm or fire.

Stand: A group of trees possessing sufficient uniformity in composition, constitution, age, arrangement or condition to be distinguished from adjacent groups of trees.

Stocking: A measure of the spatial distribution of trees on an area.

Strip (or Block) Cutting: Modified logging operation which removes a tree crop in a square (block) or narrow rectangle strip pattern in one or more operations.

Stumpage: The price charged for Crown timber harvested in Ontario. Stumpage fees set by government — which owns the timber — and charged to forest companies — which cut the trees — are based on the volume or weight of wood.

Sustained Yield: The growth of timber that a forest can produce and that can be cut to achieve a continuous approximate balance between the growth of timber and timber cut.

Tending: Any operation, such as cleaning, thinning or spraying, carried out to improve a forest crop at any stage of its life.

Thinning: A tending operation where cuts are made in a forest stand, usually past the sapling stage, for the purpose of stimulating growth and improving the quality of the stand.

Timber Management Plan: A document containing pertinent information and prescriptions which determine how a forest is managed for a specified period of years.

Timber Reserves: Forested areas which are reserved from harvesting to protect other non-timber resource features, land uses or values.

Vegetative Propagation: The growing of new trees which are genetically identical to the parent tree. Better known as cloning, it usually involves rooting cuttings taken from seedlings.

Yield: The harvest, actual or estimated, over a given period of time.



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FOREST FILES

*Ontario's forest resources:
some facts about forests*



Ministry of
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FOREWORD

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-1988
F53

The Forest Files have been created as an easy-to-use reference guide to facts about forests and forest management in Ontario.

This first edition was produced in April 1988 and includes files on the following topics:

File one	Introduction
File two	Planning Future Forests
File three	Harvesting
File four	Regeneration and Tending
File five	Forest Research and Tree Improvement
File six	Surveying Ontario's Forests
File seven	Forest Protection: Fire
File eight	Forest Protection: Pests
File nine	For More Information

New files will be created from time to time to provide you with information on topical subjects.

Individual copies of the Forest Files are available free of charge. There will be a nominal charge for bulk orders. Copies can be ordered from:

Ministry of Natural Resources
Public Information Centre
Room 1640
99 Wellesley St. W.
Whitney Block, Queen's Park
Toronto, Ontario
M7A 1W3
(416) 965-9751

Cheques or money orders should be made payable to the Treasurer of Ontario, and payment must accompany order.

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AN INTRODUCTION

1

File number one
Spring 1988

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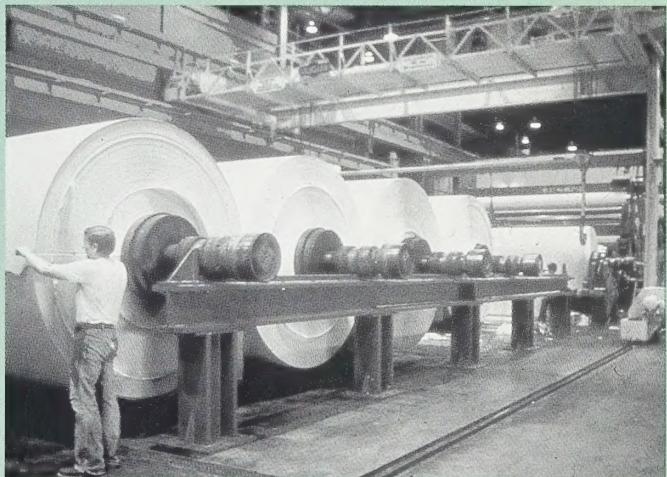
Black spruce seedlings—where forest regeneration begins



Well managed forests are essential to good wildlife habitat.



Our forests provide raw material for a major provincial industry.



Ontario is the source of about 20 per cent of Canada's wood and wood product exports.



Ontario has 40 million hectares of productive forest land. Forests provide the raw material to maintain an important industry in the province. Forests also make Ontario an admired recreational and tourist area. The Ontario Ministry of Natural Resources manages this renewable resource for both social and economic benefits.

An Introduction

- Forty million of the 46 million hectares of Ontario forest land is classed as productive forest. The Crown, on behalf of the people of Ontario, owns 84 per cent of the productive forest. The rest is privately (15 per cent) or federally (one per cent) owned.
- The total volume of wood (called the growing stock) in Ontario's forests is 5.1 *billion* cubic metres, 4.4 billion of which is on Crown land. The total annual harvest of Crown timber is about 20 *million* cubic metres, or less than half of one per cent of the growing stock.
- If the province's total wood volume were packed into standard-sized railway boxcars, the "train" would stretch around the earth 14 times at the equator. A train hauling the total annual harvest from Crown forests would extend from Toronto to Winnipeg.
- Ontario's forests provide many economic and social benefits to the province. The mandate of the Ministry of Natural Resources (MNR) is to manage the forests owned by the people of Ontario for their benefit.
- Ontario has three forest regions: Boreal, Great Lakes-St. Lawrence and Deciduous.

Ontario's Forest Regions



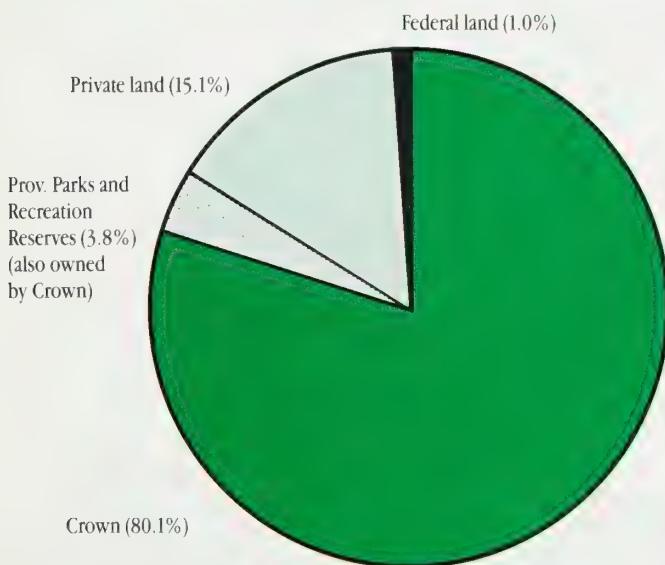
Economic Benefits

- Forests provide the raw materials for an important sector of the provincial economy, which produces pulp, paper, lumber and other wood products. Roughly 150,000 Ontarians have jobs related directly or indirectly to the forest industries. More than 66,000 of them are employed in the wood products, pulp and paper industries. Another 9,000 have jobs in wood harvesting. The other 75,000 jobs are indirectly supported by the forest industry.
- There are more than 750 sawmills in Ontario; there are three pulp mills, 17 pulp and paper mills, and 19 paper and paperboard producers. The total value of shipments of forest industry products is in excess of \$10.0 billion annually. About \$3.5 billion is exported. Ontario accounts for about 20 per cent of Canada's wood and wood products exports.
- The forest products industry is the sixth largest employer among manufacturing industries in Ontario. In terms of value of total sales, the industry ranks seventh largest among Ontario manufacturing industries. Its sales are triple those of the textile industry and about equivalent to the metal fabricating industry. They are 31 times the total direct revenue of the tourism industry.
- There are 24 large and many small forest companies operating in Ontario. The economic impact of the forest industry is more apparent in northern Ontario. In the northwestern region of the province, for example, the forest industry accounts for over three-quarters of manufacturing employment.
- In some smaller northern communities, such as Elk Lake (near Englehart) and Calstock (near Hearst), 90 per cent of the workforce is employed in sawmills, plywood and particleboard mills. In larger communities, such as Kapuskasing, Dryden, Fort Frances, Marathon and Smooth Rock Falls, 30 to 60 per cent of the local labor force works in pulp and paper mills.
- The forest industry is also important economically to southern Ontario. Fifty-eight per cent of those employed in the manufacturing of forest products live in the south.
- While most of the productive forest land is on Crown land, there is also an active industry involved in wood production on private land, much of it in southern Ontario. About 18 per cent of the industrial roundwood harvested in Ontario annually comes from private forests. Many private woodlot owners grow Christmas trees or produce maple syrup. Private landowners are encouraged to manage their woodlots through co-operative agreements with MNR.
- Provincial revenues from stumpage fees for cutting timber amounted to \$64.1 million in 1986-87.

Environmental Benefits

- Forests provide shelter and food for a wide variety of wildlife. Areas which have special significance in terms of wildlife habitat are protected from loss or damage through timber management planning procedures. Harvesting techniques can be modified to ensure that logging activities do not interfere with fish or wildlife habitat. And in some cases, harvesting techniques can enhance wildlife habitat.
- Forests, particularly in southern Ontario, help to prevent flooding and erosion.
- Ontario's reputation as a prime recreational and tourist area would not be what it is today without the beauty and grandeur of its forests. A major attraction of Ontario's 219 provincial parks is their magnificent scenery.

Ownership of Productive Forest Land Total Productive Area = 39.9 Million Hectares



Ontario's forests, a great place for outdoor fun in the winter.

Forest Management

- The Ministry of Natural Resources directly spent \$206 million on forest management activities in 1986-87. The costs of management include collecting seed and growing seedlings for planting, site preparation and seeding or planting. MNR also reimbursed forest companies (at the level of MNR's costs for the same work) for carrying out management activities on its behalf, such as site preparation, planting and road construction.
- For the purposes of planning, sections of the province have been divided into more than 100 forest management units. There are three kinds of forest management units:

Crown Management Units, where the ministry does all the forest management planning and is responsible for implementation of those plans. Harvesting is actually done by private operators under short-term timber licences;

Company Units or Long-term Timber Licence, where the ministry is responsible for all management activities except harvesting, which is the licence-holder's responsibility; the licensee also prepares forest management plans which are approved by the ministry;

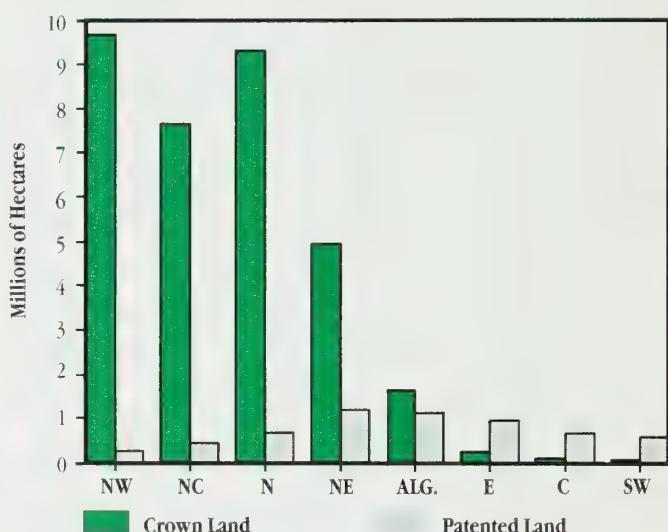
Forest Management Agreements (FMAs), where the Crown (the ministry) enters into a contractual agreement with a forest company. The company agrees to undertake all forest management planning, subject to approval by the Minister, and to carry out the activities for each five-year period, including site preparation, regeneration, tending, access road construction and maintenance and harvesting.

Forest Management Agreements

- About 69 per cent of all the land under timber licence in Ontario is covered by Forest Management Agreements. There are 30 FMAs covering almost 18 million hectares. The total licenced area is almost 26 million hectares.
- The Crown Timber Act was amended in 1978 to provide for the signing of FMAs because of the advantages of integrating harvesting and regeneration activities by the same party.
- The forest companies benefit from long-term tenure as long as they fulfill their obligations under the agreement. The FMAs are initially for 20 years, but every five years, there is a review to ensure that the management plans are being carried out properly.
- The five-year reviews have shown a significant improvement in regeneration activities compared to the five-year term prior to the signing of the FMAs. The three reviews conducted in 1986-87 showed that regeneration had increased 29 per cent, while the actual harvest had increased by nine per cent. Tending had increased 129 per cent and site preparation 138 per cent.
- Since the first agreements were introduced in 1979, 329,000 hectares of forest have been regenerated by forest companies.

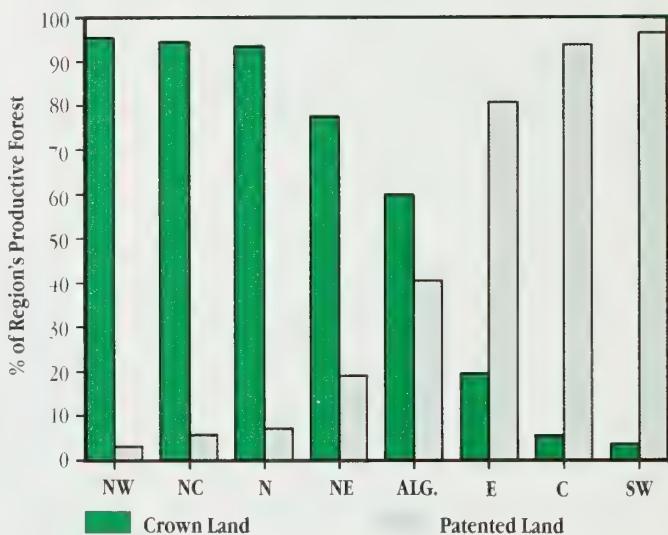
Ownership of Productive Forest Land by Region

— Area



Ownership of Productive Forest Land by Region

— Percentages



FOREST FILES

Ontario's forest resources:
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PLANNING FUTURE FORESTS

2

File number two
Spring 1988

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Millions of seedlings are planted every year on cutover areas.



A ministry forester and a landowner discuss plans for improving the woodlot.



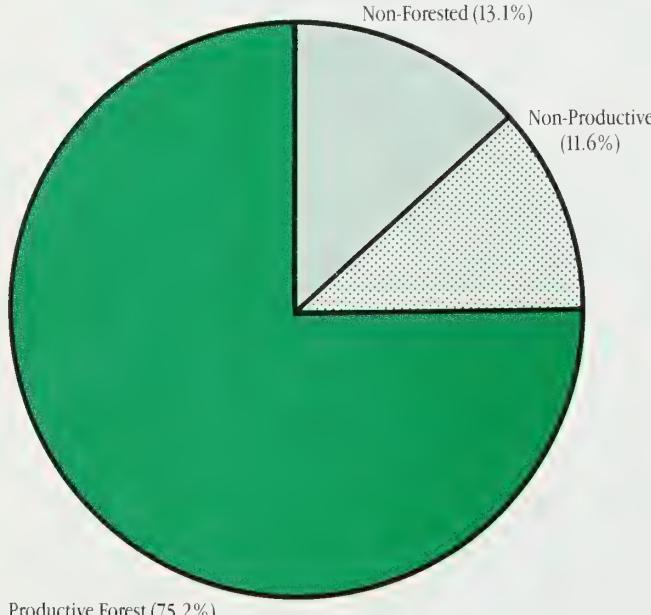
forests management involves planning. Timber management plans are written for each management unit.

Plans identify not only which timber management activities should take place — such as harvesting, assessing, renewal and tending — but also takes into account the impact of these activities on fish and wildlife habitat and use of the area for recreational purposes. The planning process provides for the sustainable use of the resource.

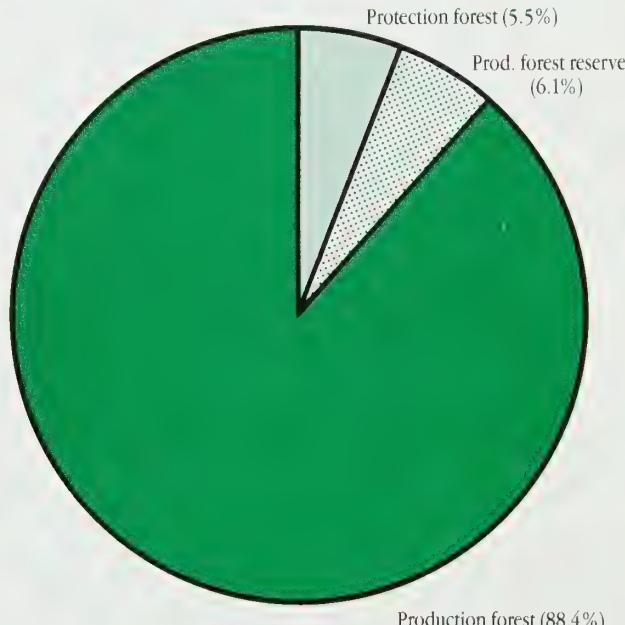
Planning Future Forests

- Forests are living entities. They are subject to incursions of disease, insects, fire and severe weather, as well as the effects of aging, the impact of harvesting and urbanization.
- The timber management planning of the Ministry of Natural Resources (MNR) has to take into account all these factors. MNR fights fires, treats forests against pests, and conducts research into frost-hardiness and tree diseases. It is involved in developing genetically superior trees that will grow faster and stronger. It works with industry to ensure that harvesting and regeneration are part of integrated timber management planning.
- MNR seeks public involvement and participation in developing management plans for the forests of Ontario. The public is encouraged to participate in the preparation, review and inspection of timber management plans for specific forest areas.
- These timber management plans are evaluated and updated every five years. The planning teams of the ministry include not only foresters, but biologists, land-use planners and engineers. These professionals consider the level of protection needed for other uses or “values” of the forest, such as wildlife habitat, fish spawning areas and recreational and tourist sites.
- The plans identify the locations where timber harvesting can and cannot take place. They include the “silvicultural ground rules” which specify the types of harvesting, regeneration and tending treatments for the forest sites.

Classification of the Province into Broad Land Classes.
Total Land Area = 53.1 Million Hectares



Classification of Productive Forest



The Forest Estate

- Planning for the forests of the future must recognize certain basic conditions. The first is that the old natural forest in Ontario is gradually being depleted, and being replaced by a new forest, one which is planned and managed by professionals.
- The forest industry, which makes a major contribution to the provincial economy, will depend on timber in the old, natural forest for another 40 to 50 years. The industry will then need wood from the new, managed forest.
- The “old” forest is exactly that. The trees are aging. Natural catastrophes, such as fire, insect and disease infestation, do not occur at regular intervals or in a regular distribution, so that most natural forests have predominantly old or young trees.
- The selection or allocation of older forest stands for harvesting is initially based on maturity of the timber.
- The choice of the nature and type of regeneration treatment such as relying on natural regeneration following harvesting, planting or seeding, are dependant on many factors related not only to the existing forest but also the area's priority for investment. Therefore, location, extent, soil productivity and species are all taken into account by the forester.

Management Strategy

- There are 40 million hectares classed as productive forest in Ontario. The management strategy for different areas of the province varies with the location and type of forest.
- MNR uses information about the biological and physiographic condition of the forest. Forest managers measure such factors as the depth and texture of the soil, types of vegetation, moisture content, the volume of stands of given species of trees, and the relation of tree height to age. This ecological information is used, along with other factors such as accessibility of the site, to help determine the management strategy for each area.
- Application of the strategy may result in no cutting at all on some sites, for environmental or economic reasons, or, on the other hand, it may outline an intensive management program.



Sawmills provide jobs for thousands of Ontarians.



From transplanter to transplant bed—a vital step in growing seedlings.



Trees are marked for selective cutting, an important step in hardwood forest management.



ONTARIO'S
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HARVESTING

CAZON
NR
- 1988
F53

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File number three
Spring 1988



Commercial forests are grown to be harvested for forest industry requirements. Controls on Crown land ensure that timber is harvested in an environmentally sound manner.



The timber industry is an integral part of the forest management process. The harvesting operation is the final step in a long-term planning process. These plans are designed to ensure maximum sustainable production and protection of resources. It must be remembered that many forests do have limited regeneration capacity and some cutting techniques can result in long-term damage to the forest.

Harvesting

- To the layman, harvesting timber is just cutting down trees. To the forester, it is an integral part of the resource management process, and often the first step.
- Most of the commercial timber in the province is on Crown land in northern Ontario. Forest companies are issued timber licences to sections of Crown forest are subject to a number of controls.
 - The timber management planning process — as required in the Crown Timber Act — includes three steps: a timber management plan, which describes the proposed harvesting and silvicultural operations for a given area over 20 years; a plan of operations, which identifies where logging will take place during a five-year period and what revisions to the general plan are warranted by changing local conditions; and an annual work schedule which is also reviewed and approved before any harvesting may commence.
 - The **Timber Management Planning Manual for Crown Lands** (1986) describes how to prepare a timber management plan. It also includes specific requirements to involve the public in the planning process.
 - All timber operations in Ontario are also subject to **MNR's Policy for the Integration of Other Resource Values in Timber Management**. Other “values” include such things as fish and wildlife habitat, recreation and tourism.

To assist in the implementation of that policy, guidelines have been developed for the protection of fisheries and moose habitat and tourism values. The tourism guidelines are designed to help the timber and tourist industries work together to reach mutually satisfactory ways to protect both their interests. The guidelines are a product of co-operation between the Northern Ontario Tourist Outfitters



The block cutting method of harvesting used on this site will ultimately regenerate as an even-aged forest.

Association, the Ontario Forest Industries Association, the Ontario Ministry of Tourism and Recreation and the Ministry of Natural Resources.

- Ontario's Environmental Assessment Act establishes general provisions for the protection of all public resources. A Class Environmental Assessment for timber management has been submitted by the Ministry of Natural Resources (MNR) to the Minister of the Environment for review and approval. Public hearings will be held, starting in 1988, to review the planning process as set out in the Class EA.
- In addition to these controls on all timber operations in general, there are specific requirements which apply to particular management areas in which logging is permitted.

More than two-thirds of the 26 million hectares of land under timber licence is covered by 30 **Forest Management Agreements** (FMAs). (On the other third, MNR is responsible for regeneration treatments and other management activities, and the company is responsible for harvesting.)

Under the 20-year FMAs, each signed by the Minister of Natural Resources and a forest company for a particular area of forest, the company agrees to carry out prescribed activities in site preparation, regeneration, tending, road-building and harvesting. The company must prepare a management plan, the five-year operating plans, and annual work schedules and reports for ministry approval and must comply with ground rules which set out the treatments on specific sites.

The harvest may not exceed the **Maximum Allowable Depletion** (MAD), which indicates the amount of area from which timber may be depleted over a five-year period by any means, including harvesting, fire, insects, disease or allocation for purposes other than

logging (e.g. protected wildlife habitat).

Every five years, the ministry conducts a review to ensure that the obligations under the agreement are being met. If the FMA is being operated according to plan, the agreement is extended for another five-year period. This is called an "ever-green" provision.

- Management of an area of forest may call for different kinds of harvesting. There are a variety of harvesting techniques:

Clear cutting involves harvesting of an entire section of the forest in one operation;

Strip cutting involves removal of a tree crop in either strips or blocks;

Shelterwood cutting involves leaving individual trees or groups of trees or alternating strips standing to provide seed and cover conditions for natural or artificial regeneration;

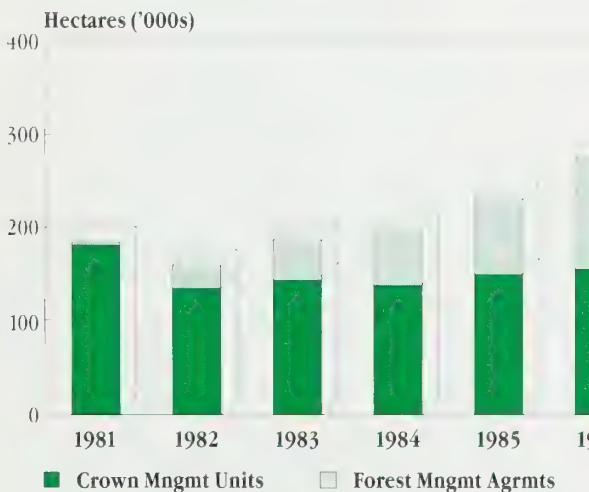
(These three silvicultural systems are used to produce even-aged forests.)

Selection cutting involves harvesting of selected mature trees in a forest and results in uneven or many-aged forests.

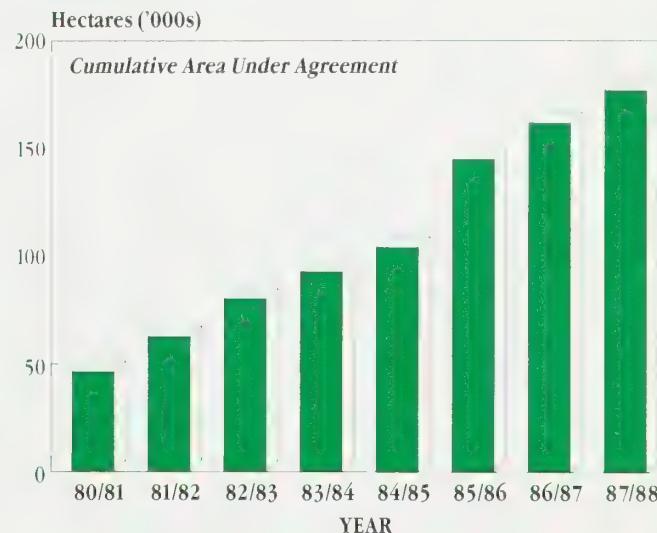
- The harvesting technique used in a particular area depends on a number of factors, including the type of site, location, accessibility and potential volume of wood, the kind of regeneration that will take place after cutting and the impact on other uses and values of the forest.

Example 1: The site is good — the soil is rich, the climate conditions ideal and the location is near a major lumber mill — but the trees growing on it are low-value or diseased. It may be decided to clear-cut the area to

Total Silviculture — FMA vs Crown Areas Treated: 1981–86



Forest Management Agreements 1980–1988



make way for an intensive artificial regeneration program which will re-stock the site with strong, fast-growing trees in a desired species.

Example 2: The physical characteristics of the site are mediocre, and it is located in a relatively remote area. It is populated mostly with black spruce. Since black spruce regenerates well from seed provided by trees on the site, a strip or block cut might be used, allowing the area to regenerate on its own.

Example 3: The site is near a hunting lodge or other tourist spot. Harvesting would be modified to preserve the esthetics of the area and create some sort of buffer around the lodge. This could be done in a variety of ways, taking into account natural topography, scenic vistas and other conditions of the landscape.

- There is no single correct way of harvesting — local conditions and priorities must be considered. Harvesting can be carried out so that regeneration is encouraged or accelerated and other uses of the forest are protected.

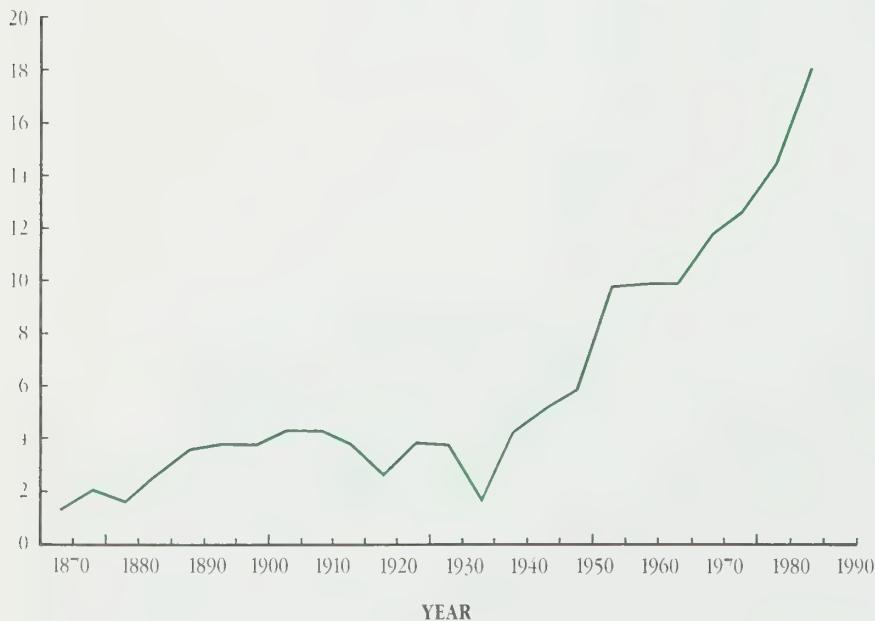


Leaving buffer zones around lakes and streams is important for maintaining fish habitat and preventing erosion.

Ontario Annual Roundwood Production.

Crown Lands — All Species — 5 year Average

PRODUCTION (Millions of Cubic Metres)



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A scarifier prepares a site for regeneration by exposing mineral soil.



Cones are gathered for seed extraction to grow seedlings for regeneration.



Black spruce seedlings arrive at a cutover site ready for planting.

REGENERATION AND TENDING

4

File number four
Spring 1988



Silvicultural activities involved in regenerating and renewing the forests of the future through active forest regeneration treatments can take place where forests have been harvested. Regeneration treatments may include such activities as site preparation, timber production, seedling planting and tending.

Regeneration and Tending

Ontario's forests will normally regenerate naturally after they are depleted by harvesting, fire, insects or disease. Artificial means can be used — seeding or planting — to accelerate the processes of nature and to control the species and quality of the trees in the new forest.

Site Preparation

- The purpose of site preparation is to prepare a site for planting seed or stock; to help control competitive vegetation, to help regulate the spacing of a new forest stand; and to clear obstacles out of the path of tree planters.
- Bulldozers and other heavy equipment may be used to push or pull implements that will prepare a site for planting or seeding.

Prescribed Fire

- The controlled use of fire, called prescribed burning, can be used on certain sites to burn off slash and other vegetation, destroying any disease or insects. The use of fire also adds valuable nutrients to the soil by consuming the layer of dead leaves, conifer needles and undergrowth that covers most forest floors, and releasing this into the soil. The seeds of some tree species germinate after fire.

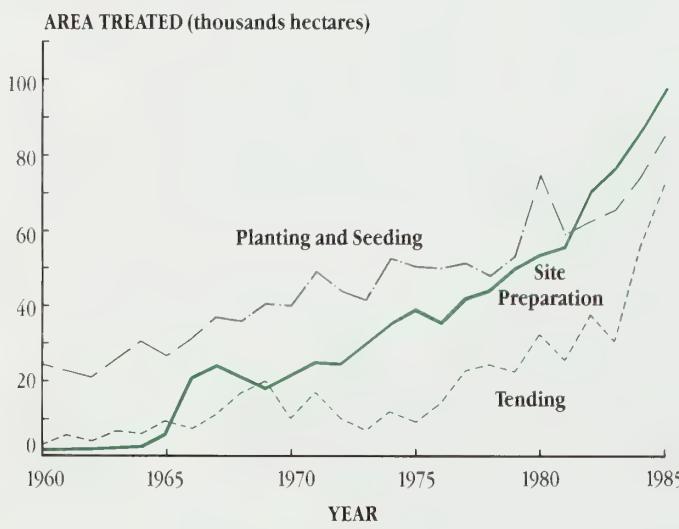
Seeding

- Seeding can be done by machine or it can be carried out from the air, particularly in areas of the north which are not easily accessible on the ground.
- The Ministry of Natural Resources (MNR) distributes over two billion seeds a year. More than a billion of those are used for direct seeding. The rest are used for seedling production and research.
- Seed that is collected in the forest is sent to one of MNR's two seed extraction plants, in Angus (near Barrie) and Dryden (in the northwest), which remove and clean the seeds from cones and fruit. There are about 15.6 billion seeds of 57 species stored at these two plants. The storage of seeds ensures that in the event of some natural catastrophe in a forest area, such as a fire or severe insect infestation, there is sufficient seed collected from the region to provide stock for a regeneration program.

Planting

- Planting of seedlings — tiny trees grown in nursery beds (called bareroot stock) or in containers (called container stock) — can be done by hand or by machine. The machinery is similar to agricultural planters.
- MNR shipped about 155 million seedlings produced by ministry nurseries and greenhouses and 26 private growers to planting sites across Ontario in 1986-87. About 78 million of those seedlings were produced by private growers.

Silvicultural Activities in Ontario Since 1960



- It takes two to three years to grow bareroot trees and they are 20 to 30 cm high when they are ready for planting. The containerized trees are 10 to 15 cms high when they are ready to plant, after a period of 16 weeks to one year in the greenhouse.
- It costs about \$380 to grow enough trees to plant a hectare of forest. Planting costs are about \$250 to \$350 per hectare. The initial costs of artificial regeneration are high, compared to natural regeneration, but because the plantings are spread out for optimal growth, there is less need to thin a forest stand later to prevent overcrowding.

Tending

- After a site is planted, it may require tending to promote good growth and form of the trees. Activities include:

Cleaning out vegetation competing for sunlight and soil nutrients;

Thinning to remove some of the trees to avoid overcrowding or to remove diseased or damaged trees;

Pruning to minimize the spread of disease or insects and to improve the quality of the tree by reducing knotting;

Fertilization and cultivation to enrich and till the soil;

Spraying herbicides for vegetation management.

(Pruning and fertilization are seldom used in Ontario's northern forests.)

Annual Regeneration Effort

- Through the efforts of the ministry and the forest industry, in the year ending March 31, 1986, about 108,000 hectares of Crown forest received regeneration treatments (including seeding and planting of seedlings), 95,000 hectares were site prepared, and 77,000 hectares were tended. Another 40,000 hectares of other land (privately owned or held by agencies such as conservation authorities) also received silvicultural treatments.



Checking the growth of a forest stand is an important part of tending.



About 155 million seedlings were grown in greenhouses in Ontario in 1986-87.



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FOREST RESEARCH AND TREE IMPROVEMENT

5

File number five
Spring 1988

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-1988
F 53



Forestry technicians take electrical conductivity measurements to determine the frost hardiness of container grown seedlings in preparation for outside winter storage.



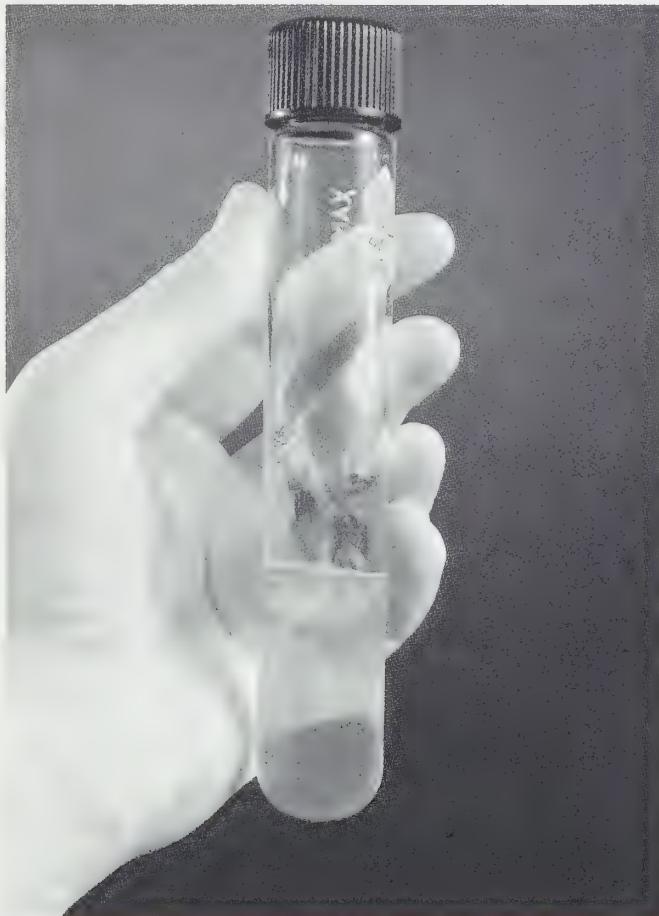
part of the ministry's role in forest management – both research and development. The ministry's research centre, called the Ontario Tree Improvement and Forest Biomass Institute, conducts forest research programs that provide new knowledge about forest management.

Forest Research and Tree Improvement

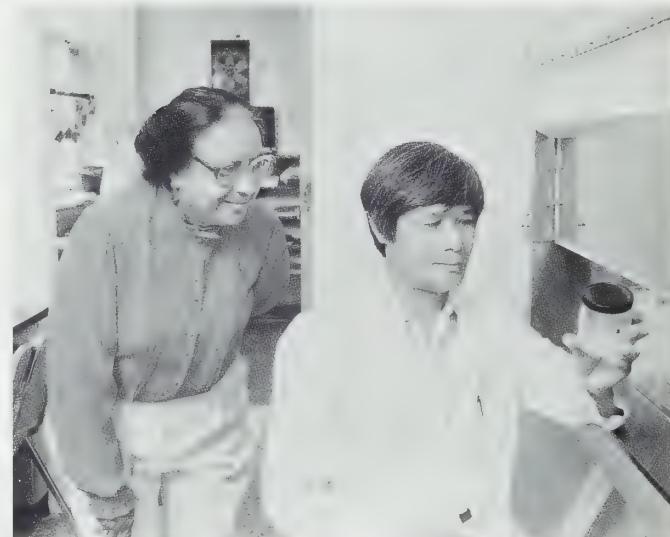
- Silviculture is the art and science of growing and tending forests. However, before a seed or seedling is put into the ground, a great deal of research and development has gone into making the new tree as straight, healthy and fast growing as possible.
- Research and development related to forestry is one of the functions of the Ministry of Natural Resources. Top priority is given to improving those tree species which are the foundation of the forest industry such as black and white spruce and jack and white pine.

Tree Improvement

- Trees of superior quality have been selected in forest stands across the province and are used for seed collection.
- Scientists studying tree growth help to identify these superior trees, to ensure that these superior trees are genetically superior and not just superior due to more favorable environmental conditions.
- The seed that is collected is identified by its place of origin and after it has passed through the extraction and nursery seedling production systems, the seedlings are planted near their place of origin.



A biologist examines a rooted cutting of hybrid poplar.



Scientists examine the progress of a black spruce seedling produced by tissue culture.

- To provide genetically improved seed, seed orchards are being established throughout the province. Superior trees are propagated by grafting cutting of superior trees onto root stock and subsequently planting them in the seed orchards.
- Highest quality trees are also propagated by cloning, which involves rooting cuttings that have been taken from these high quality trees. These trees are then a genetic carbon copy of their trees of origin. The rooted cuttings are subsequently planted in operational plantations.

Nursery Stock Production

- Approximately 160 million seedlings are produced annually in the province. It is the goal of research that all the seedlings are of the highest quality, so that after planting, they survive and grow as quickly as possible, reducing the rotation of the plantation.
- Planting stock quality research involves the study of nursery cultural practices and handling and storing practices as well as planting practices. This research is backed up with planting trials, which are monitored yearly until plantation establishment.

Forest Ecology

- Site research is conducted to assist the forest manager in optimizing the use of the forest sites. The type of site will determine the harvesting technique that can be used and, after harvesting, the type of site preparation required for regeneration with a specific species. It is also important in seed zone identification.
- Tolerant hardwood studies are being conducted to maximize the yield of our tolerant hardwood forests and to improve the quality of our hardwoods.
- Spruce-fir management and budworm control studies are carried out to reduce wood losses to budworm and to provide us with a better understanding of stand dynamics.

Biotechnology

- Studies in biotechnology involve test-tube culture of the four important conifer species. Biotechnology also provides for gene pools and rapid propagation of trees with desirable traits as well as the manipulation of desirable genes.



Forest research includes developing seedlings that will produce high-quality trees.

Research Centres

- MNR is involved in both state-of-the-art research and new development of practical applications. The Ontario Tree Improvement and Forest Biomass Institute (OTIFBI), at Maple and its four field units (in Midhurst, Huntsville, Sault Ste. Marie and Thunder Bay), carry out a variety of programs in tree physiology, genetics and genecology, forest ecology, stock production, biotechnology, forest biomass and seed.
- MNR is establishing a Northern Forest Biology Centre on the campus of Lakehead University in Thunder Bay. The centre will conduct research and provide an exchange of information between the university, the ministry and field staff.
- In 1986, MNR announced the addition of two new Technology Development Units (TDUs), one in Thunder Bay and the other in North Bay, to bring the provincial total to four. The other two are in Brockville and Timmins. The TDUs test and develop the latest forest management techniques for application in their regions.
- The scientists at the Maple headquarters of OTIFBI and the silviculturalists, geneticists, foresters and others working in the Forest Resources Group offices at Queen's Park in Toronto, will all be moving to Sault Ste. Marie by 1991, as part of the Ontario government's northern initiatives program.
- The federal-provincial Canada-Ontario Forest Resource Development Agreement (COFRDA), a \$150-million, five-year, cost-sharing agreement, signed in 1984 by the Ontario and federal government, supports many research and development projects which are designed to enhance the province's forests.



MNR researchers measure the daily growth of white spruce in an experimental planting site at OTIFBI.



FOREST FILES

Ontario's forest resources:
some facts about forests



Ministry of
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SURVEYING ONTARIO'S FORESTS

6

File number six
Spring 1988

CAZON
NR
-1988
F 53



Survey party teams examine the characteristics of a tree.



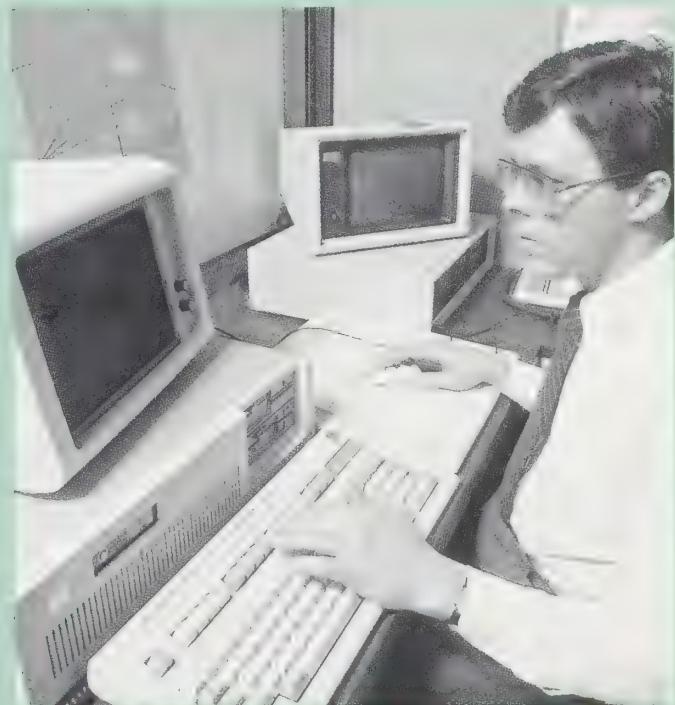
A photointerpreter identifies tree stands through a stereoscope.



Careful records are kept on when forest resources inventory information is distributed to field offices.



Planning teams use FRI information for resource and transportation planning, among other functions.



MNR is developing state-of-the-art computerized mapping.



The Forest Resources Inventory in Ontario provides important information on the volume, species, condition and regeneration of the province's forests. It uses a Resource Management System and computerized mapping to represent state-of-the-art technology in the field of forest inventory.

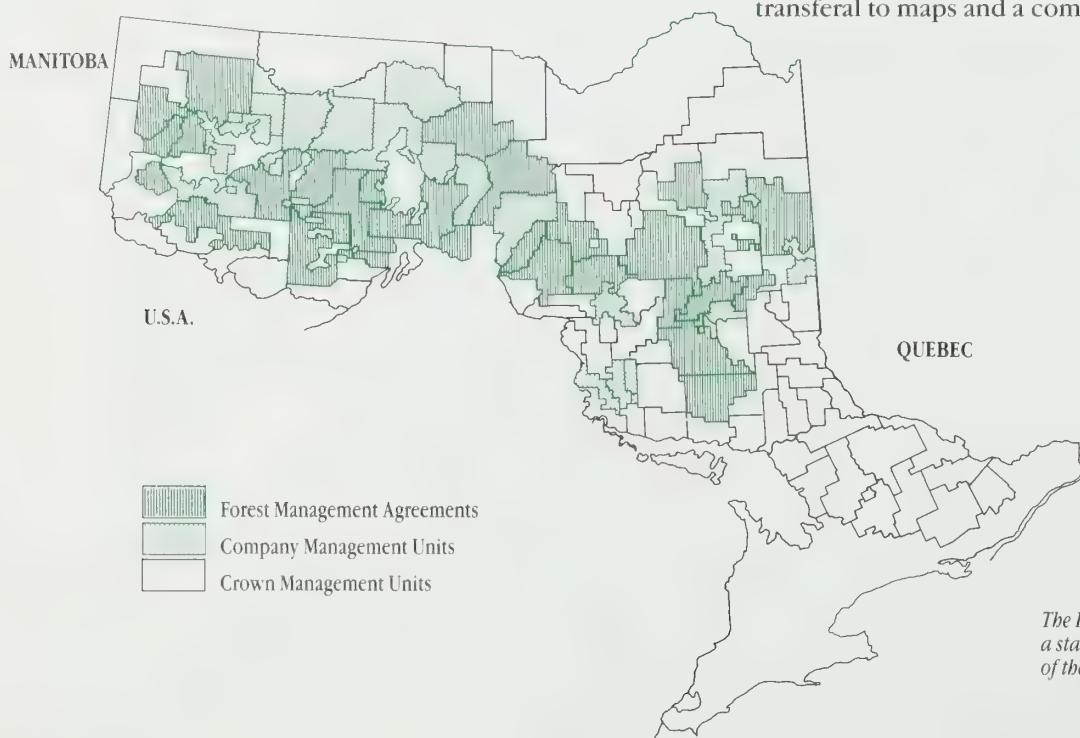
Surveying Ontario's Forests

With 46 million hectares of forest land in Ontario, keeping track of all those trees is a mammoth project. But it is important to know, for example, how much wood is available for industry, what species of trees are located in which areas, what condition the forests are in, and how well regenerated areas are growing.

Forest Resources Inventory

- To take stock of the forests of Ontario, MNR's Forest Resources Inventory (FRI) uses a combination of aerial photography, photo-interpretation and ground verification to provide a picture of the extent, nature and condition of Ontario's forests. The inventory consists of statistics, maps, photographs and a computerized data base and provides information on each of the province's forest management units.
- The boundaries of the FRI extend from the southern limit of Ontario northward to the James Bay area (latitude 50 degree N in northeastern Ontario and 52 degree N in the northwest). Because the area is so large — almost 62 million hectares — the FRI is carried out in stages. Over a 20-year cycle, a section of the province is re-surveyed and updated.
- The FRI is prepared by MNR staff, in co-operation with the forest industry, which shares the \$20 to \$35 cost per square kilometre. The total cost is about \$3-million to inventory 1/20th of the province each year.
- The whole process takes three years: the first year for the aerial photography; the next year for ground crews to measure sample plots every 2.6 square km in the photographed area and for photo-interpreters to use the photos and plot data to describe individual forest stands; the third year for validation of the data, and transferal to maps and a computerized data base system.

Forest Management Units in Ontario, 1986



The Forest Resources Inventory provides a stand-by-stand description for each of the province's forest management units.

- The FRI provides information on forest stands in terms of species, height, age, stocking (an expression of the adequacy of tree cover), site class (productive capacity for a species) and volume.
- Operational surveys, called operational cruises, may also be carried out by MNR district staff or company staff to verify the aerial photography and provide additional detailed information on areas which are scheduled to be harvested within five years.
- Aerial surveys can provide more information than numbers, species and size of trees. MNR's Centre for Remote Sensing developed a technique in the late 1970s for surveying forest regeneration from the air.
- The FRI is developing the use of large-scale photography for specific areas. Remote sensing via satellites may help to record major changes in the forest; and computerization of map data will make that data more flexible and accessible.

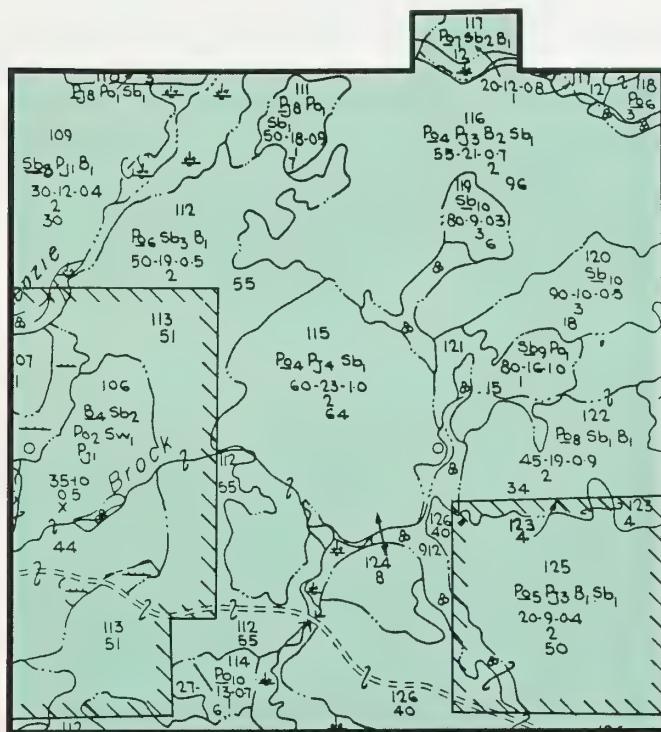
Computerized Mapping

- MNR is developing state-of-the-art computerized mapping. In 1986-87, MNR began a two-year project to test the application of computer-recorded information to upgrade mapping systems and to assess the markets for this new technology. The project involves production of digital topographic data and graphics for 1,000 medium-scale maps.
- This map data will be useful for forest management, as well as regional geographic information systems which will aid in community and resource planning, land administration, transportation and other planning functions.

Forest Regions

- There are three distinct forest regions in Ontario: the Boreal forest, the Great Lakes-St. Lawrence forest, and the Deciduous forest.
- The Boreal is the largest, most northerly forest region in Ontario: its southern boundary runs along an uneven line roughly parallel to the north shore of Lake Superior; to the north of the Boreal forest is a semi-tundra area adjacent to Hudson and James Bays called the Hudson Bay Lowlands. The Boreal forest is dominated by conifer or evergreen species, such as spruce and jack pine. The most common deciduous species are white birch and poplar.
- The Great Lakes-St. Lawrence forest generally lies along the Great Lakes and the St. Lawrence and Ottawa River valleys. It is a mixed forest, containing some of the conifers of the Boreal forest, together with white and red pine, and some of the hardwoods of the Deciduous region, such as maple, beech, red oak and ash.
- The Deciduous forest is located mainly in southwestern Ontario and is the only forest region of its kind in Canada. It contains mostly valuable hardwoods: oak, ash, walnut and hickories, and a number of the Carolinian species (prevalent in the eastern coastal states of the U.S.), such as the tulip, black gum and sassafras trees.

A Portion of a Forest Resources Inventory Stand Map.



Legend

109 — Stand Number
Sb_s PJ₁, B₁ — Working Group (Underlined)
 30 - 12 -
 0.4 — Age, Height (Metres), Stocking
 2 — Site Class (X is Site Class 1A)
 30 — Area in Hectares
 — Stand Boundary
 — Open Muskeg
 — Brush and Alder
 — Grass and Meadow
 — Delineates Patented Land
 — Intermittent Stream

Working Group Codes

Sb	— Black Spruce
Sw	— White Spruce
B	— Balsam Fir
Pj	— Jack Pine
Po	— Poplar





ONTARIO'S
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FOREST FILES

Ontario's forest resources:
some facts about forests



Ministry of
Natural
Resources

FOREST PROTECTION: FIRE

7

File number seven
Spring 1988

CAZON
NR
-1988
F53



MNR's success rate in extinguishing fires by initial attack is better than 95 per cent.



The ministry's forest fire management program encompasses integrated prevention, detection and suppression; its aim is to prevent the loss of life, property, property and resources; and to ensure the natural benefits of fire land and resource management.

Forest Protection: Fire

Fire is part of the natural life cycle of the forest. Controlling damage from this potentially devastating natural phenomenon is part of integrated forest management.

The three major objectives of the fire management program of the Ministry of Natural Resources (MNR) are: to prevent the loss of human life, to prevent personal injury and to minimize social disruption from fire; to ensure that fires have a minimal effect on public works, private property and natural resources; and to use the natural benefits of fire to achieve ministry objectives for land and resource management.

Aviation and Fire Management Centre

- The role of MNR's Aviation and Fire Management Centre (AFMC) is not just fighting fires, although that is its most high-profile duty. Fire management, as it is practised by the ministry, also includes prevention, training and early detection of fires, fire area planning and co-ordination, research and development in fire management technology, and the use of planned and controlled fires to prepare areas for regeneration.
- The AFMC, which is located in Sault Ste. Marie, also provides aviation services for firefighting, non-scheduled air transport for the Ontario government, and radio telecommunications services for MNR field operations. In addition to the provincial fire centre, there are five regional fire centres in Timmins, Huntsville, Sudbury, Thunder Bay and Dryden.

MNR fights fires with CL-215 water bombers.



Fire Incidence

- Wildfires can endanger lives, threaten whole communities, destroy property and consume thousands of hectares of commercially valuable timber. In Ontario in 1986, 1,088 fires destroyed 145,461 hectares of forest. The previous 10-year average was 1,700 fires which consumed 234,000 hectares. MNR's success rate in extinguishing fires by initial attack is better than 95 per cent, based on a five-year average.

Fire Prevention

- The Ontario Fire Region, as defined in The Forest Fires Prevention Act, covers a large part of Ontario — all except the extreme north and the largely urban or agricultural southern area. The Act establishes a number of controls which apply during Ontario's fire season from April 1 to October 31. There are rules governing the setting and tending of campfires, requirements for fire permits for any fire outdoors except those used for cooking and warmth, and a prohibition against smoking while walking or working in the forest.
- The Act gives the Minister of Natural Resources authority to impose special restrictions, such as a ban on open fires or limitations on travel in certain areas, during periods of extreme hazard.

Causes of Fires

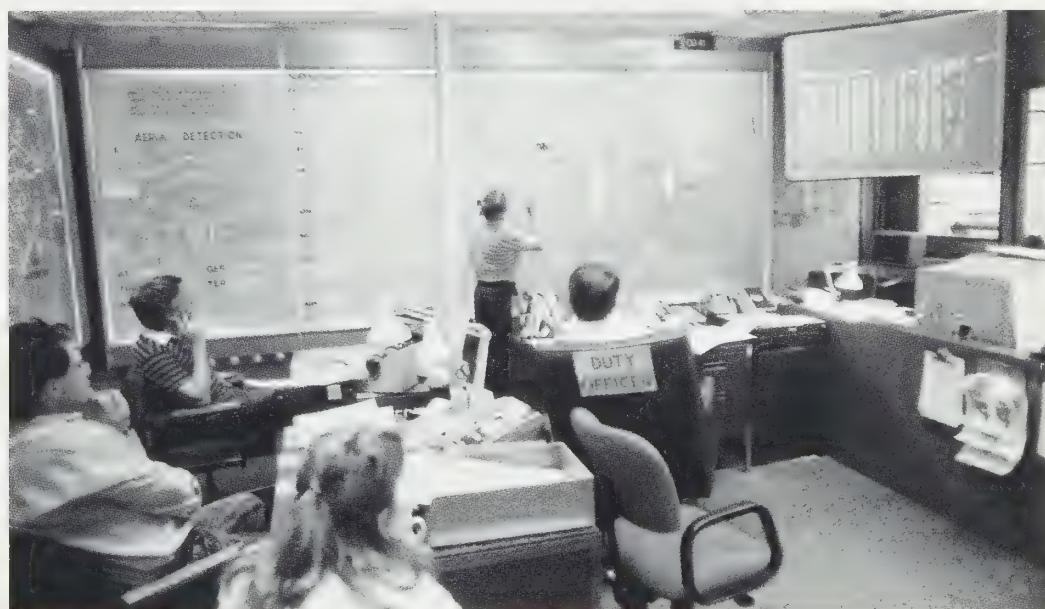
- All these precautions are necessary because people cause most forest fires. The only natural cause of forest fires is lightning, which accounts for 30 per cent. The other 70 per cent are started by human carelessness. Through its education campaigns, MNR warns people of the dangers of careless smoking (which accounts for nearly one-quarter of people-caused fires), unintended campfires (19 per cent), unintended trash or brush fires (13 per cent) and other careless practices.

Fire Prediction and Detection

- MNR has a highly sophisticated, computer-assisted system of predicting fire risk. Factors include weather, moisture levels in the forest, topographical features of an area, available "fuel" (e.g. fast-burning brush) and lightning.
- The ministry owns and operates 150 primary and secondary weather stations across Ontario. It has three automatic recording stations and 70 manual portable stations for monitoring on-site weather conditions. It operates a lightning detection network, comprising 12 direction finder stations across the north, linked by datalines to a position analyzer at the AFMC. The system can pinpoint lightning strike locations within one minute of the occurrence.
- Ministry personnel patrol areas, such as major recreational sites, where the risk of people-caused fire is high. In the early days of this century, fire detection was done by rangers stationed in wooden lookouts. Aerial surveillance began in the 1920s and by the 1970s had completely replaced the old lookout system.

Fire Suppression

- The core of the firefighting effort is the trained five-member fire crew. There are usually 170 fire crews available across the province. Six fire teams, comprising fire specialists, are on short-term alert for duty anywhere in Ontario and are capable of organizing the more difficult fire situations.
- Air support is also crucial to modern fire suppression techniques. An initial attack from the air can usually slow the spread of the fire and give ground crews time to reach the scene and get the blaze under control.



A regional fire centre—nerve centre for fire suppression planning.

MNR's fleet contains the Canadair CL-215 heavy water bomber, the only aircraft specifically designed for fire-fighting. It can refill its 5,455-litre water tanks in 10 seconds by skimming the surface of a lake and taking in water through the bottom of the hull. It can remain airborne for four hours before refuelling.

- The ministry has nine CL-215s. Five are currently ministry-owned and the rest are provided under a federal-provincial agreement. MNR is in the process of modernizing its fleet by selling off its older single-engine aircraft and concentrating on the heavy water bombers and Twin Otters, complemented by light and medium helicopters.
- Ontario shares its equipment and manpower with other jurisdictions during emergencies, and receives assistance in a fire crisis. Requests for help are channelled through the Canadian Interagency Forest Fire Centre in Winnipeg. The forest industry also provides firefighting help when necessary. Ontario is the lead agency in a five-year federal program to develop a model forest fire management system in China.

Use of Fire

- To make the best use of firefighting resources, priorities must be set. In some cases, it is possible and even beneficial to let some fires burn themselves out. These are fires in the remote north which do not threaten either communities or valuable resources.
- Fire is such a natural part of the ecosystem of the northern Boreal forest in Ontario that some species of trees have adapted over time so that their seeds are dispersed after fire. By consuming dead leaves, needles and other debris on the forest floor, fire also puts valuable nutrients back into the soil and opens the way for new growth.
- That is why fire is used, under carefully controlled conditions, to meet the needs for site preparation for forest regeneration. A "prescribed burn" also eliminates slash, which ignites easily and burns rapidly, to reduce the risk of wildfire. Fifty-eight prescribed fires were conducted in 1986-87, treating an area of 14,323 hectares.



The effects of a forest fire look devastating but fires aren't all bad. Fires play a role in natural forest regeneration.



FOREST FILES

Ontario's forest resources:
some facts about forests



Ministry of
Natural
Resources

FOREST PROTECTION: PESTS

8

File number eight
Spring 1988

CAZON
NR
- 1988
F 53



Ontario conducts aerial spraying programs to control destructive epidemics of forest insects.



Pest control is one aspect of forest management. While insects will always be a part of the forest, we can manage our forests to live with them and protect our valuable forest resources.

Forest Protection: Pests

- Insects are a natural part of the living dynamics of a forest and, as such, pests will never be eradicated from the forest. Pest control involves assessing the damage from infestations, developing protection measures when and where the problem is serious, and targeting those measures where they are needed most — generally, to protect valuable timber stands, important wildlife habitat and prime recreational areas.
- In the past decade, severe infestations by the spruce budworm, the jack pine budworm and the gypsy moth necessitated extensive annual aerial spraying program by the Ministry of Natural Resources (MNR).
- An epidemic of spruce and jack pine budworm in northern Ontario has caused the defoliation of millions of hectares of valuable timber while the gypsy moth is attacking southern Ontario, concentrating in the eastern region.
- The MNR program launched in 1985 was the largest forest protection spray project in Ontario history. About 250,000 hectares were sprayed with the biological insecticide *Bacillus thuringiensis* (Bt). The protection program also included earlier harvesting of some of the damaged and dead trees.



Infestations of the jack pine budworm cause defoliation of valuable timber in northern Ontario.

- Bt is a protein-based insecticide which affects only those insects which become moths or butterflies.
- In 1986, the aerial spraying program was almost tripled to 736,000 hectares at a cost of about \$28 million. It included the spraying of 679,000 hectares of Crown forest — 150,000 hectares sprayed against spruce budworm, 482,000 hectares against jack pine budworm, and 47,000 against gypsy moth. Another 47,000 hectares of private land were sprayed against gypsy moth.
- By the end of 1986, the results were encouraging. Federal and provincial entomologists have forecast that the major spruce budworm infestation in the north is starting to decline. The jack pine budworm populations have collapsed in northeastern Ontario and are expected to decline in the northwest in 1987.
- In August 1987, the ministry announced that defoliation caused by gypsy moths had dropped by 90 per cent, compared to 1986. Ministry entomologists credited a naturally-occurring virus as the most important cause of the gypsy moth's decline. However, the gypsy moth has not been wiped out in eastern Ontario, where infestations were the most severe. There are small pockets in the region which continue to be infested.
- Aerial spraying on more than 225,000 hectares of prime timber and recreational sites continued in 1987. But the major pest control focus is shifting to strengthen other initiatives, including increased efforts to reallocate and accelerate harvesting of affected timber stands and evaluation of the impact of these pests.
- The ministry follows all existing federal and provincial legislation in its spray program.



Feeding damage by the gypsy moth has become a problem in southern Ontario.



Heavy infestations of the gypsy moth has caused total stand defoliation in some parts of Ontario.



ONTARIO'S
GROWING
FORESTS

FOREST FILES

CAZON
NR
-1988
F 53

*Ontario's forest resources:
some facts about forests*



Ministry of
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FOR MORE INFORMATION

9

File number nine
Spring 1988

Organizations

Canadian Forestry Association, 185 Somerset Street West, Suite 203, Ottawa, Ontario, K2P 0J2, (613) 232-1815

Canadian Institute of Forestry, 151 Slater Street, Suite 1005, Ottawa, Ontario K1P 5H3, (613) 234-2242

Canadian Lumbermen's Association, 27 Goulburn Avenue, Ottawa, Ontario, K1N 8C7, (613) 233-6205

Canadian Pulp and Paper Association, Sun Life Building, 19th floor, 1155 Metcalfe Street, Montreal, Quebec, H3B 4T6, (514) 866-6621

Canadian Wood Council, 55 Metcalfe St., Suite 1550, Ottawa, Ontario, K1P 6L5, (613) 235-7221

Christmas Tree Growers' Association of Ontario, P.O. Box 94, Angus, Ontario, L0M 1B0, (705) 424-5763

International Woodworkers of America, 2088 Weston Rd., Weston, Ontario, M9N 1X4, (416) 247-8628

Ontario Forest Industries Association, 130 Adelaide Street West, Suite 1700, Toronto, Ontario, M5H 3P5, (416) 368-6188

Ontario Forestry Association, 150 Consumers Road, Suite 209, Willowdale, Ontario, M2J 1P9, (416) 493-4565

Ontario Forestry Council, c/o Abitibi-Price Inc., 2 First Canadian Place, Box 39, Toronto, Ontario, M5X 1A9, (416) 369-6700

Ontario Lumber Manufacturers' Association, 55 University Ave, Suite 325, Toronto, Ontario, M5J 2H7, (416) 367-9717

Ontario Maple Syrup Producers' Association, Box 877, Maple, Ontario, L0J 1E0, (416) 832-2543

Ontario Professional Foresters' Association, 10255 Yonge St., Ste. 202, Richmond Hill, Ontario, L4C 3B2, (416) 884-7845

Provincial Government

Forest Resources Group, Ministry of Natural Resources, c/o Aviation and Fire Management Centre, P.O. Box 310, 747 Queen St. E., Sault Ste. Marie, Ontario P6A 5L8, (705) 942-1800.

Communications Services Branch, Ministry of Natural Resources, Room 5340, Whitney Block, Queen's Park, 99 Wellesley St. W., Toronto, Ontario M7A 1W3, (416) 965-2756

Public Information Centre, Ministry of Natural Resources, Room 1640, Whitney Block, Queen's Park, 99 Wellesley St. W., Toronto, Ontario M7A 1W3, (416) 965-9751

Communications Branch, Ministry of the Environment, 6th Floor, 135 St. Clair Ave. W., Toronto, Ontario, M4V 1P5, (416) 323-4321

Federal Government

Canadian Forestry Service, Place Vincent Massey, 351 St. Joseph Blvd., Ottawa, Ontario, K1A 0C5, (613) 997-1107

Great Lakes Forest Research Centre, P.O. Box 490, 1219 Queen St. East, Sault Ste. Marie, Ontario, P6A 5M7, (705) 949-9461

Petawawa National Forestry Institute, Canadian Forestry Service, Chalk River, Ontario, K0J 1J0, (613) 589-2884

Colleges

Algonquin College of Applied Arts and Technology, 315 Pembroke Street East, Pembroke, Ontario, K8A 3K2, (613) 735-4700

Sir Sandford Fleming College, Natural Resources Division, P.O. Box 8000, Lindsay, Ontario, K9V 5E6, (705) 324-9144

The Sault College of Applied Arts and Technology, 443 Northern Ave., P.O. Box 60, Sault. Ste. Marie, Ontario, P6A 5L3, (705) 949-2050

Universities

Lakehead University, School of Forestry, Thunder Bay, Ontario, P7B 5E1, (807) 343-8507

University of Toronto, Faculty of Forestry, 203 College Street, Toronto, Ontario, M5S 1A1, (416) 978-6152

Ministry of Natural Resources Field Offices

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Box 5160, 810 Robertson St., Kenora, P9N 3X9
Dryden, Box 730, P8N 2Z4
Fort Frances, 922 Scott St., P9A 1J4
Ignace, Box 448, P0T 1T0
Kenora, Box 5080, 808 Robertson St., P9N 3X9
Red Lake, Box 5003, Hwy 105, P0V 2M0
Sioux Lookout, Box 309, P0V 2T0

(807) 468-3111
(807) 223-3341
(807) 274-5337
(807) 934-2233
(807) 468-9841
(807) 727-2253
(807) 737-1140

ALGONQUIN REGION

Box 9000, Brendale Sq., Huntsville, P0A 1K0
Algonquin Park, Box 219, Whitney, K0J 2M0
Bancroft, Box 500, K0L 1C0
Bracebridge, Box 1138, Hwy 11, P0B 1C0
Minden, K0M 2K0
Parry Sound, 4 Miller St., P2A 1S8
Pembroke, Box 220, K8A 6X4

(705) 789-9611
(705) 637-2780
(613) 332-3940
(705) 645-8747
(705) 286-1521
(705) 746-4201
(613) 732-3661

NORTH CENTRAL REGION

Box 500, 435 James St. S., Thunder Bay, P7C 5G6
Atikokan, 108 Saturn Ave., P0T 1C0
Geraldton, Box 640, P0T 1M0
Nipigon, Box 970, P0T 2J0
Terrace Bay, Box 280, P0T 2W0
Thunder Bay, Box 5000, 435 James St. S., P7C 5G6

(807) 475-1251
(807) 597-6971
(807) 854-1030
(807) 887-2120
(807) 825-3205
(807) 475-1511

EASTERN REGION

Gov't. Bldg., Concession Rd., Kemptville, K0G 1J0
Brockville, Box 605, Oxford Ave., K6V 5Y8
Carleton Place, 10 Findlay Ave., K7C 3Z6
Cornwall, Box 1749, 113 Amelia St., K6H 5V7
Napanee, 1 Richmond Blvd., K7R 3S3
Tweed, Box 70, Metcalfe St., K0K 3J0

(613) 258-3413
(613) 342-8524
(613) 257-5735
(613) 933-1774
(613) 354-2173
(613) 478-2330

NORTHEASTERN REGION

199 Larch St., 9th floor, Sudbury, P3E 5P9
Blind River, Box 190, 62 Queen St., P0R 1B0
Espanola, Box 1340, P0P 1C0
North Bay, Box 3070, RR 3, Hwy 63, P1B 8K7
Sault Ste. Marie, Box 130, 69 Church St., P6A 5L5
Sudbury, Box 3500, Station A, P3A 4S2
Temagami, Box 38, P0H 2H0
Wawa, 22 Mission Road, P0S 1K0

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(705) 356-2234
(705) 869-1330
(705) 474-5550
(705) 949-1231
(705) 522-7823
(705) 569-3622
(705) 856-2396

CENTRAL REGION

10670 Yonge St., Richmond Hill, L4C 3C9
Cambridge, RR 1, Beaverdale Road, N3C 2W1
Huronia, Midhurst, L0L 1X0
Lindsay, 322 Kent St. W., K9V 2Z9
Maple, L0J 1E0
Niagara, Box 1070, Hwy 20, Fonthill, L0S 1E0

(416) 884-9203
(519) 658-9355
(705) 728-2900
(705) 324-6121
(416) 832-2761
(416) 892-2656

NORTHERN REGION

Box 3000, 140 Fourth Ave., Cochrane, P0L 1C0
Chapleau, 190 Cherry St., P0M 1K0
Cochrane, Box 730, 2 Third Ave., P0L 1C0
Gogama, Box 129, Low Ave., P0M 1W0
Hearst, Box 670, P0L 1N0
Kapuskasing, 6 Government Rd., P5N 2W4
Kirkland Lake, Box 129, Swastika, P0K 1T0
Moosonee, Box 190, P0L 1Y0
Timmins, 896 Riverside Dr., P4N 3W2

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(705) 864-1710
(705) 272-4365
(705) 894-2000
(705) 362-4346
(705) 335-6191
(705) 642-3222
(705) 336-2987
(705) 267-7951

SOUTHWESTERN REGION

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Aylmer, 353 Talbot St. W., N5H 2S8
Chatham, Box 1168, 435 Grand Ave. W., N7M 5L8
Owen Sound, 611 Ninth Ave. E., N4K 3E4
Simcoe, 548 Queensway W., Box 706, N3Y 4T2
Wingham, Box 490, RR 5, N0G 2W0

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(519) 773-9241
(519) 354-7340
(519) 376-3860
(519) 426-7650
(519) 357-3131

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